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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/715,923	11/18/2003	Angeliki Alexiou	5	4221

7590 03/22/2007  
Docket Administrator  
(Room 3J-219)  
Lucent Technologies Inc.  
101 Crawfords Corner Road  
Holmdel, NJ 07733-3030

EXAMINER
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GESESSE, TILAHUN

ART UNIT	PAPER NUMBER
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2618

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/22/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/715,923

Applicant(s)

ALEXIOU, ANGELIKI

Examiner

Tilahun B. Gesessse

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 December 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments with respect to claims 1-9 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over prior art admission "admission" in view of Winters et al "Winters" (US 7,006,810).

Claims 1,3 Admission teaches a method of evaluating frame error probability FER of a selected communications link in a wireless telecommunications network, the link being between a MMO transmitter comprising one of a base station or mobile user terminal (see figures 2-3 , in which a MIMO system 12 of figure 2, transmitter 12 having N transmitter antennas 16 and MIMO receiver 18, having M receive antennas 20, the presence of  $N_0$ ,  $E_b$  bit energy or FER drivable from channel and processor runs, frame error probability FER values and data or lookup data calibration data from system 12 determines capacity of channel, see page 2-page 3 of dated 12/20/06 known art amendment and page 4, lines 8-18 and page 4, lines 25-page 5, line 2) the other of the base station or mobile user terminal, (see figures 2 and 3 and page 4 line 8-page 6 ,line 2) comprising:

Admission teaches determining values of instantaneous channel capacity of a MIMO channel of a mobile user terminal at multiple time instructs over a predetermined time, (see figure 3 and page 3, of 12/20/06 fourth paragraph , a series of instantaneous channel evaluate FER verses channel capacity of interest and page 4 line 8-page 5, line 2 and fig.2)

Admission teaches processing the values to determine a level of channel capacity which any of the instantaneous channel capacity values has a predetermined probability value, (see figure 3 and page 3, of 12/20/06 fourth paragraph , a series of instantaneous channel evaluate FER verses channel capacity of interest,)

Admission teaches looking up (memory 28) (see fig. 3)

Admission does not teach the instantaneous channel capacity values has is to a predetermined probability below given level.

However, Winters not teach the instantaneous channel capacity values has is to a predetermined probability below given level ( see column 9, lines 25-41 and figures 4-5).

Winters teach in similar field multiple in and multiple out transceiver and capacity monitoring technique, then , it would have been obvious to an artisan of ordinary skill in the art to compare the error rate and improve capacity accordingly, in the admission , as evidenced by Winters, in order to improve capacity by providing feedback to the transmission antenna, as result minimize error rate in MIMO communication environment.

Claim 2. Admission does not specifically teach the predetermined probability is 0.5 so the level of channel capacity selected is the mean of the instantaneous channel capacity values in the predetermined period. However, it would have been obvious to use such 0.5 probability channel capacity as shown figures 3-4 of Winters analysis FER verses capacity.

Claim 4, admission teaches estimating average signal to noise ratio experienced by the mobile user terminal during the predetermined time period, and also using this to evaluate FER, as a function of both channel capacity level and average signal to noise ratio (, (see page 4 line 8-page 5, line 2 and fig.2)

Claim 5, Admission teaches calculating each value of instantaneous channel capacity from parameters including the channel matrix state of the link, and the average signal to noise ratio experienced by the link at that time (see page 4 line 8-page 5, line 2 and figs.2-3)

Claim 6, Admission teaches a method of evaluating frame error probability FER of a selected communications link in a wireless telecommunications network, the link being between a MMO transmitter comprising one of a base station or mobile user terminal (see figures 2-3 , in which a MIMO system 12 of figure 2, transmitter 12 having N transmitter antennas 16 and MIMO receiver 18, having M receive antennas 20, the presence of  $N_0$ ,  $E_b$  bit energy or FER drivable from channel and processor runs, frame error probability FER values and data or lookup data calibration data from system 12

determines capacity of channel, see page 2-page 3 of dated 12/20/06 known art amendment and page 4, lines 8-18 and page 4, lines 25-page 5, line 2) the other of the base station or mobile user terminal, (see figures 2 and 3 and page 4 line 8-page 6 ,line 2) comprising:

Admission teaches determining values of instantaneous channel capacity of a MIMO channel of a mobile user terminal at multiple time instructs over a predetermined time, (see figure 3 and page 3, of 12/20/06 fourth paragraph , a series of instantaneous channel evaluate FER verses channel capacity of interest and page 4 line 8-page 5, line 2 and fig.2)

Admission teaches processing the values to determine a level of channel capacity which any of the instantaneous channel capacity values has a predetermined probability value, (see figure 3 and page 3, of 12/20/06 fourth paragraph , a series of instantaneous channel evaluate FER verses channel capacity of interest,)

Admission teaches looking up (memory 28) (see fig. 3)

Admission does not teach the instantaneous channel capacity values has is to a predetermined probability below given level.

However, Winters not teach the instantaneous channel capacity values has is to a predetermined probability below given level ( see column 9, lines 25-41 and figures 4-5).

Winters teach in similar field multiple in and multiple out transceiver and capacity monitoring technique, then , it would have been obvious to an artisan of ordinary skill in the art to compare the error rate and improve capacity accordingly, in the admission , as

evidenced by Winters, in order to improve capacity by providing feedback to the transmission antenna, as result minimize error rate in MIMO communication environment.

Claim 7, admission teaches a wireless communication network (See figure 1) a MIMO transmitter comprising one of a base stations or mobile station and MIMO receiver Admission teaches a method of evaluating frame error probability FER of a selected communications link in a wireless telecommunications network, the link being between a MMO transmitter (see figures 2-3 , in which a MIMO system 12 of figure 2, transmitter 12 having N transmitter antennas 16 and MIMO receiver 18, having M receive antennas 20, the presence of  $N_0$ ,  $E_b$  bit energy or FER drivable from channel and processor runs, frame error probability FER values and data or lookup data calibration data from system 12 determines capacity of channel, see page 2-page 3 of dated 12/20/06 known art amendment and page 4, lines 8-18 and page 4, lines 25-page 5, line 2) the other of the base station or mobile user terminal, (see figures 2 and 3 and page 4 line 8-page 6 ,line 2) comprising:

Admission teaches determining values of instantaneous channel capacity of a MIMO channel of a mobile user terminal at multiple time instructs over a predetermined time, (see figure 3 and page 3, of 12/20/06 fourth paragraph , a series of instantaneous channel evaluate FER verses channel capacity of interest and page 4 line 8-page 5, line 2 and fig.2)

Admission teaches processing the values to determine a level of channel capacity which any of the instantaneous channel capacity values has a predetermined

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probability value, (see figure 3 and page 3, of 12/20/06 fourth paragraph , a series of instantaneous channel evaluate FER verses channel capacity of interest,)

Admission teaches looking up (memory 28) (see fig. 3)

Admission does not teach the instantaneous channel capacity values has is to a predetermined probability below given level.

However, Winters not teach the instantaneous channel capacity values has is to a predetermined probability below given level ( see column 9, lines 25-41 and figures 4-5).

Winters teach in similar field multiple in and multiple out transceiver and capacity monitoring technique, then , it would have been obvious to an artisan of ordinary skill in the art to compare the error rate and improve capacity accordingly, in the admission , as evidenced by Winters, in order to improve capacity by providing feedback to the transmission antenna, as result minimize error rate in MIMO communication environment.

Claims 8-9, Admission teaches a station for wireless communications (see figures 1-3) comprising operative to evaluating frame error probability FER of a selected communications link in a wireless telecommunications network, the link being between a MMO transmitter comprising one of a base station or mobile user terminal (see figures 2-3 , in which a MIMO system 12 of figure 2, transmitter 12 having N transmitter antennas 16 and MIMO receiver 18, having M receive antennas 20, the presence of  $N_0$ , Eb bit energy or FER drivable from channel and processor runs, frame error probability



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FER values and data or lookup data calibration data from system 12 determines capacity of channel, see page 2-page 3 of dated 12/20/06 known art amendment and page 4, lines 8-18 and page 4, lines 25-page 5, line 2) the other of the base station or mobile user terminal, (see figures 2 and 3 and page 4 line 8-page 6 ,line 2) comprising:

Admission teaches determining values of instantaneous channel capacity of a MIMO channel of a mobile user terminal at multiple time instructs over a predetermined time, (see figure 3 and page 3, of 12/20/06 fourth paragraph , a series of instantaneous channel evaluate FER verses channel capacity of interest and page 4 line 8-page 5, line 2 and fig.2)

Admission teaches processing the values to determine a level of channel capacity which any of the instantaneous channel capacity values has a predetermined probability value, (see figure 3 and page 3, of 12/20/06 fourth paragraph , a series of instantaneous channel evaluate FER verses channel capacity of interest,)

Admission teaches looking up (memory 28) (see fig. 3)

Admission does not teach the instantaneous channel capacity values has is to a predetermined probability below given level.

However, Winters not teach the instantaneous channel capacity values has is to a predetermined probability below given level ( see column 9, lines 25-41 and figures 4-5).

Winters teach in similar field multiple in and multiple out transceiver and capacity monitoring technique, then , it would have been obvious to an artisan of ordinary skill in the art to compare the error rate and improve capacity accordingly, in the admission , as

evidenced by Winters, in order to improve capacity by providing feedback to the transmission antenna, as result minimize error rate in MIMO communication environment.

### ***Conclusion***

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tilahun B Gesesse whose telephone number is 571-272-7879. The examiner can normally be reached on flexible schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban can be reached on 571-272-7899.

The Central FAX Number is 571-273-8300. For patent related correspondence, hand carry deliveries must be made to the Customer Service Window (now located at the Randolph Building, 401 Dulany Street, Alexandria, VA 22314), and facsimile transmissions must be sent to the Central FAX number .

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TG

March 12, 2007

  
**TILAHUN GESESSE**  
**PRIMARY EXAMINER**